



Fact Sheet

US Army Engineer
Research and Development Center
Waterways Experiment Station

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Heavy Vehicle Simulator - Aircraft (HVS-A) Mark V

Purpose: The Heavy Vehicle Simulator - Aircraft (HVS-A) Mark V can apply full-scale traffic loads to experimental pavement test sections rapidly and precisely. This capability is necessary for the development and validation of models to be used for analyzing, designing, and evaluating pavements. This capability also permits full-scale evaluations for determining the influence of both innovative materials and construction techniques on pavement performance.

Background: The collection of pavement response and performance data is an essential step toward developing and validating pavement models. Historically, these data have been obtained by monitoring the performance of in-service pavements or by applying accelerated traffic to pavement test sections. When monitoring in-service airfield pavements, useful performance data is obtained only after long periods of time: aircraft passes accumulate slowly and pavement design lives are often 20 years or more. Also, quantifying and/or controlling all the variables that affect pavement performance can be difficult under these circumstances. For these reasons, full-scale test sections provide valuable, complimentary data. The simulation of aircraft traffic has historically been accomplished either by modifying trucks to support weights over single aircraft tires or by pulling loaded aircraft assemblies with a tractor. Under these conditions, which include the use of human drivers, accurate control over speed and wander is difficult.



Facts: In November 1998, the U.S. Army Engineer Waterways Experiment Station (WES) accepted delivery of the HVS-A Mark V, which is the world's largest portable, automated device for imposing accelerated traffic on pavements. The HVS-A Mark V is capable of trafficking a 12.2 m (40 ft) pavement test section with a single- or dual-wheel assembly (vehicle or aircraft), with imposed loads ranging from 44.5 to 445 kN (10,000 to 100,000 lbs). Simulated traffic loads can be uni- or bi-directional, can include any type of pre-programmed lateral wander, and can be applied at a rate as high as 16,000 passes per day. On-board instrumentation records load magnitude and position, which facilitates the essential coordination between these data and pavement response data. In addition to trafficking pavements at WES, the HVS-A Mark V can be transported to an airfield or pavement of interest, allowing experiments to be conducted on-site.

Point of Contact: For more information, contact either Dr. Larry Lynch (601-634-4274; e-mail at lynchl@wes.army.mil) or Dr. Reed Freeman (601-634-2951; e-mail at freemar@wes.army.mil). Additional information may be obtained at <http://pavement.wes.army.mil>.